REMARKS

Claims 1 – 4 and 6 – 32 are now pending in the application. Claim 5 has been cancelled herein without prejudice or disclaimer of the subject-matter contained therein. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1 – 8, 10, 12 – 16, 18, 20 – 25, 27, 29 and 30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Jankovic et al. (U.S. Pat. No. 6,584,392). This rejection is respectfully traversed.

At the outset, Applicants note that claims 1 and 29 have been amended to include calculating an actuator variable by determining a mass airflow into an intake manifold of the engine based on an engine shaping filter. Jankovic fails to teach or suggest determining a mass airflow into an intake manifold based on an engine shaping filter.

The present invention provides a torque-based control system that controls engine torque using available actuators including, but not limited to, throttle, spark and fuel. A torque command is generated by an input device (e.g., accelerator pedal) and a shaped torque command is determined based on the torque command. An actuator variable (e.g., throttle position, spark timing, fueling rate) is calculated based on the shaped torque command and a gain. More specifically, the actuator variable is based on a mass airflow into an intake manifold of the engine that is determined using an engine shaping filter. The filter enables a smooth transition to changes in the actuator

variable value. The actuator is regulated based on the actuator variable to adjust the torque output of the engine to provide a feed-forward system to achieve the torque command.

Jankovic discloses a torque-based system for controlling the power output of an engine. The system determines a commanded throttle position (TP_command) based on a pedal position (PPS) and a vehicle speed (VS) (see Figure 2, block 200 and Col. 4, Lines 38 – 45). More specifically, the system determines a desired wheel torque (Tq_w_des) based on PPS and VS and subsequently determines a desired engine torque (Tq_eng_des) based on a multiplication factor (see Col. 4, Lines 46 – 54). TP_command is determined based on Tq_eng_des, a throttle position signal (TPS), a manifold absolute pressure (MAP) and/or a mass air flow (MAF). Jankovic, however, fails to teach or suggest determining an actuator variable based on a mass airflow into an intake manifold of the engine, which is determined using an engine shaping filter. Therefore, claims 1 and 20 define over the prior art and reconsideration and withdrawal of the rejections are respectfully requested.

With regard to claims 2 – 4, 6 – 8, 10, 11, 30 and 32 Applicants note that each ultimately depends from one of claims 1 and 29, which define over the prior art, as discussed in detail above. Therefore, for at least the reasons stated above with respect to claims 1 and 29, claims 2 – 4, 6 – 8, 10, 11, 30 and 32 also define over the prior art and reconsideration and withdrawal of the rejections are respectfully requested.

Claims 12 and 20 have been amended herein to include calculating an effective throttle area based on a desired APC and an inverted dynamic model of the engine including an engine shaping filter. Jankovic fails to teach or suggest calculating an

effective throttle area based on a desired APC and an inverted dynamic model of the engine including an engine shaping filter.

As discussed in detail above, Jankovic discloses a torque-based system for controlling the power output of an engine. The system determines a commanded throttle position (TP_command) based on a pedal position (PPS) and a vehicle speed (VS) (see Figure 2, block 200 and Col. 4, Lines 38 – 45). More specifically, the system determines a desired wheel torque (Tq_w_des) based on PPS and VS and subsequently determines a desired engine torque (Tq_eng_des) based on a multiplication factor (see Col. 4, Lines 46 – 54). TP_command is determined based on Tq_eng_des, a throttle position signal (TPS), a manifold absolute pressure (MAP) and/or a mass air flow (MAF). Jankovic, however, fails to teach or suggest calculating an effective throttle area based on a desired APC and an inverted dynamic model of the engine including an engine shaping filter. Therefore, claims 1 and 20 define over the prior art and reconsideration and withdrawal of the rejections are respectfully requested.

With regard to claims 13 – 16, 18, 19, 21 – 25, 27 and 28 Applicants note that each ultimately depends from one of claims 12 and 20, which define over the prior art, as discussed in detail above. Therefore, for at least the reasons stated above with respect to claims 12 and 20, claims 13 – 16, 18, 21 – 25, 27 and 29 also define over the prior art and reconsideration and withdrawal of the rejections are respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 11, 19, 28 and 32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Boverie et al. (U.S. Pat. No. 5,349,932) in view of Southern et al. (U.S. Pat. No. 5,606,951). This rejection is respectfully traversed.

Each of claims 11, 19, 28 and 32 ultimately depend from one of claims 1, 12, 20 and 29, which define over the prior art, as discussed in detail above. Therefore, claims 11, 19, 28 and 32 also define over the prior art for at least the reasons stated above with respect to claims 1, 12, 20 and 29. Therefore, reconsideration and withdrawal of the rejections are respectfully requested.

ALLOWABLE SUBJECT MATTER

The Examiner states that claims 9, 17, 26 and 31 would be allowable if rewritten in independent form. Applicants note that claims 1, 12, 20 and 29 have been amended to incorporate a relevant portion of the allowable subject-matter of claims 9, 17, 26 and 31.

OTHER CLAIM AMENDMENTS

Claims 10 and 11 have been amended herein to depend from claim 1 in view of cancelled claim 5. Claim 2 has been amended for consistency with claim 1. More specifically, the term $T_{COMSHAPED}$ has been deleted and replaced with shaped torque command.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (313) 665-4969.

If for some reason any fee needs to be paid please charge to Deposit Account No. 07-0960.

Respectfully submitted,

Dated: 5-19-05

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